<u>IN THE DRAWINGS</u>:

Figure 1 has been amended as shown on the Replacement Sheet attached hereto.

REMARKS

In the Office Action dated November 15, 2005, the drawings were objected to because of handwritten descriptions in Figure 1. In response, a revised version of Figure 1 embodying professionally lettered legends is submitted herewith.

Additionally, a typographical error was noted in claim 16, which has been corrected.

Claims 1-11, 16-19 and 21-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kohashi et al in view of Forrest et al. Claims 12-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kohashi et al and Forrest et al, further in view of Komashchenko.

In response, the subject matter of claim 12 has been embodied in independent claim 1, and claim 12 has been cancelled. The dependency of certain of the dependent claims has been changed in view of the cancellation of claim 12.

Therefore, the only relevant rejection to be addressed herein is the rejection of original claim 12, based on the teachings of Kohashi et al, Forrest et al and Komashchenko. This rejection of original claim 12 is respectfully traversed for the following reasons. The subject matter disclosed and claimed in the present application is a device for measuring a radiation dose that is suitable for introduction into the radiation beam path, for example the beam path of an x-ray apparatus, in front of the x-ray detector that detects or acquires the image information. A radiation dose measurement device that is to be used at this location must absorb as little radiation as possible, but must still supply an adequate signal. These competing goals are achieved in accordance with the present invention by structuring the absorption structure as a number of thin film layers disposed on top of each other,

which achieves the goal of low absorption, and embodying scintillator material in one of the layers to achieve the goal of suitable amplification of the signal. The device disclosed and claimed in the present application is therefore able to provide a meaningful output signal in all situations, but does not significantly block radiation from reaching the image detector. Embodying the scintillator material in one of the aforementioned layers means that the absorption structure is not significantly made thicker by the presence of the scintillator material.

Applicants respectfully submit that no such structure is disclosed or suggested by the references of record.

Both Kohashi et al and Forrest et al disclose a multi-layer detector element structured on a semiconductor basis. In Forrest et al, the layers are designed to be thin and to exhibit a certain transparency, particularly for the electrode layers. The Kohashi reference, however, is primarily concerned with the production of a solar cell that is formed by a number of such absorption structures. The ultimate goal in the Forrest et al reference is to be able to stack individual cells, as described in claim 1 of that reference for example, wherein at least three sub-cells are claimed. The Forrest et al reference is not concerned with, and therefore does not provide any teachings that are relevant to, the problem of acquiring a useable signal together with an optimally low absorption (blocking) of the incoming radiation.

The Examiner has already acknowledged that the Kohashi et al reference does not disclose a foil-like carrier on which the ionizing radiation absorption structure is disposed, the Examiner relying on the Forrest et al reference as providing such a teaching.

Moreover, although the Examiner noted in substantiating the rejection of claim 25 that Kohashi et al and Forrest et al do not expressly disclose a radiation detector disposed in the path of ionizing radiation produced by a radiation source, the Examiner stated the need for the radiation source and the need to place the detector in the path of the ionizing radiation for detecting purposes would be inherently known to those skilled in the art. Applicants of course do not dispute that those of ordinary skill in the field of designing radiation detectors have such knowledge, but for the reasons discussed above, designing a dose measurement device that is capable of generating a meaningful output signal, while simultaneously absorbing as little incoming radiation as possible, are goals that do not necessarily follow simply from having this general information. The specific manner of accomplishing those goals, as disclosed and claimed in the present application, is not suggested by either Kohashi et al or Forrest et al, even if modified in accordance with the teachings of Komashchenko.

With respect to the Komashchenko reference, the Examiner provided only an abstract. Based on a reading of this abstract, the Examiner stated the Komashchenko device or reference embodies a scintillator arranged in a layer. Attached hereto is the actual cover sheet and the single drawing of the Komashchenko publication in Russian (SU 1060035 A1), wherein it can be easily seen that the actual disclosure of that reference does not involve a scintillator arranged in a layer.

The device disclosed in the Komashchenko reference is clearly a well-known type of device generally referred to as a photomultiplier. As can be seen from the figure in the Komashchenko reference itself, the reference numeral 1 designates the

scintillator, as also explained in the abstract. The scintillator is not structured in the form of a thin layer, nor integrated into another layer, but instead is represented as an oblong block, in order to achieve a particularly high yield, given the intended use of the device as a photomultiplier. The incident radiation, characterized by the arrow A, generates secondary radiation (characterized by the arrow B). The secondary radiation B is detected by a photodetector 3. It can be seen that the scintillator 1 is separated from the photodetector 3 by a low-ohmic layer 2. The Komashchenko reference, therefore, does not disclose the use of a scintillator as a thin layer, and does not disclose or suggest integrating the scintillator into the same absorption structure that is used for detecting the light produced by the scintillator. In the Komashchenko reference, the respective functional units of the scintillator and the photodetector are clearly separated, and the scintillator is not constructed in the form of a layer. Moreover, in the abstract cited by the Examiner it is mentioned only that the photodetector is formed as a layer.

Moreover, in view of the extremely thick (although admittedly schematic) illustration of the scintillator in the drawing of the Komashchenko reference, this would deter a person of ordinary skill in the field of designing radiation dose measurement units from assuming that such a thick scintillator would be able to achieve the aforementioned goal of low radiation absorption (blockage).

For the above reasons, Applicants respectfully submit that the subject matter of original claim 12, now embodied in independent claim 1, would not have been obvious to a person of ordinary skill in the field of designing radiation dose measurement units under the provisions of 35 U.S.C. §103(a), based on the teachings of Kohashi et al, Forrest et al, and Komashchenko. The dependent claims

depending from amended independent claim 1 are submitted to be allowable over the teachings of those references for the same reasons discussed above in connection with claim 1.

A comparable amendment has been made to independent claim 25, and the above arguments apply equally to independent claim 25.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,

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СОЮЗ СОВЕТСКИХ СОЦИАЛИСТИЧЕСКИХ РЕСПУБЛИК

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ГОСУДАРСТВЕННОЕ ПАТЕНТНОЕ ВЕДОМСТВО СССР (ГОСПАТЕНТ СССР)

ОПИСАНИЕ ИЗОБРЕТЕНИЯ

К АВТОРСКОМУ СВИДЕТЕЛЬСТВУ

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(21) 3442866/25
(22) 26.05.82
(46) 07.02.93. Бюл. № 5
(72) В.Н.Комащенко, Е.Б.Круликовская, М.А.Мавин, В.Л.Фурсенко, В.Г.Чалая, В.Л.Рыжиков, О.П.Вербицкий и В.И.Силин
(56) Патент США № 2821633, кл. 250-715, опублик. 1958.
Blamires N.G., "Combination of scintillator and a semiconductor photodiode for nuebar partiele detection "Nucliar Instruments and Methods, 1963, v. 24, № 2, p. 441-447.
Авторское свидетельство СССР № 766294, кл. G 01 T 1/20, 1979.

2

(54)(57) УСТРОЙСТВО ДЛЯ РЕГИСТРАЦИИ ИОНИЗИРУЮЩИХ ИЗЛУЧЕНИЙ, содержащее выполненные из полупроводниковых соединений сцинтиллятор и нанесенный на него фотоприемник, отличающееся тем, что, с целью повышения его быстродействия и чувствительности, фотоприемник выполнен в виде слоя твердого раствора соединений $A^{II}B^{VI}$ и $A^{I}B^{VI}$, образующего гетерогенный p-n-переход с материалом сцинтиллятора.

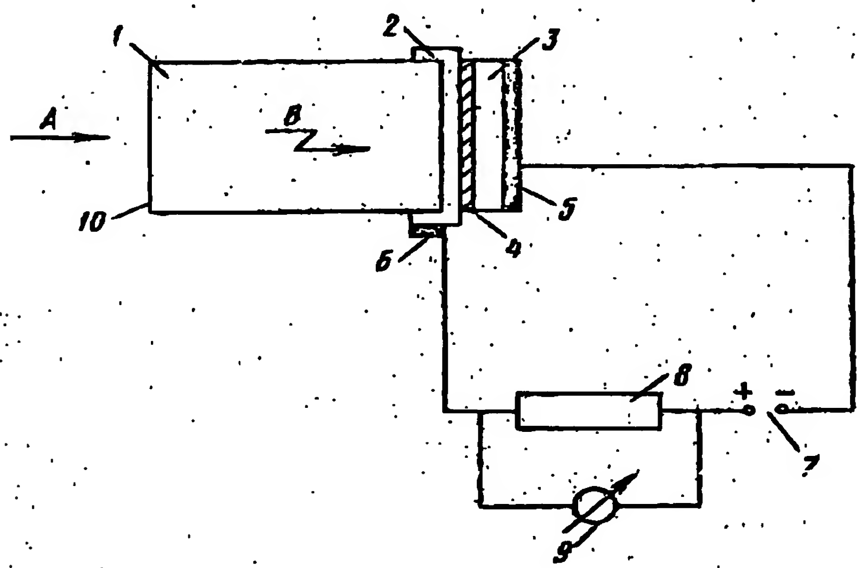
(19) SU (11) 1060035 A1

Изобретение касается регистрации и измерения интенсивности как непрерывных, так и импульсных потоков α, β и γ -излучений, рентгеновских лучей, а также нейтронов и может найти применение в системах, предназначенных для индикации и исследования этих излучений, а также в счетчиках частиц.

Известны и широко используются устройства для регистрации ионизирующих излучений, включающие сцинтиллятор, преобразующий энергию ионизирующего излучения в световую, и фотоэлектронный умножитель (ФЭУ), преобразующий вспышки света в импульсы тока или напряжения. Система сцинтиллятор - ФЭУ широко используется для радиационного анализа в области охраны окружающей среды, ядерной физике, медицинской радиологии, космических исследованиях, геологических изысканиях и ряде других. В то же время, многие применения детектирующих систем требуют их эксплуатации в условиях экстремальных температур и механических воздействий, например скважинные измерения в геологической и нефтяной разведке, космические эксперименты.

Присущая фотоумножителям хрупкость предъявляет повышенные требования к упаковке таких систем и понижает надежность их работы. Другими недостатками, присущими ФЭУ, являются нестабильность их характеристик во времени и значительный разброс

Устройство	Чувстви-тельность, отн. ед.	Время сра-батывания, мкс
На основе NaI (Tl) с фотоумножителем (базовое устройство)	1	0,5-1
На основе полупроводникового сцинтиллятора с фоторезистором из твердых растворов соединений $A^{II}B^{VI}$ (прототип)	0,2-0,4	10^3-10^4
На основе полупроводникового сцинтиллятора с гетерогенным p-n-переходом из твердых растворов соединений $A^{II}B^{VI}$ и $A^{I}B^{VI}$ (предлагаемое устройство)	1-1,5	1-10



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